

Gate Leakage vs. T_{inv} as a Function of Base Oxide Thickness and RPN Time

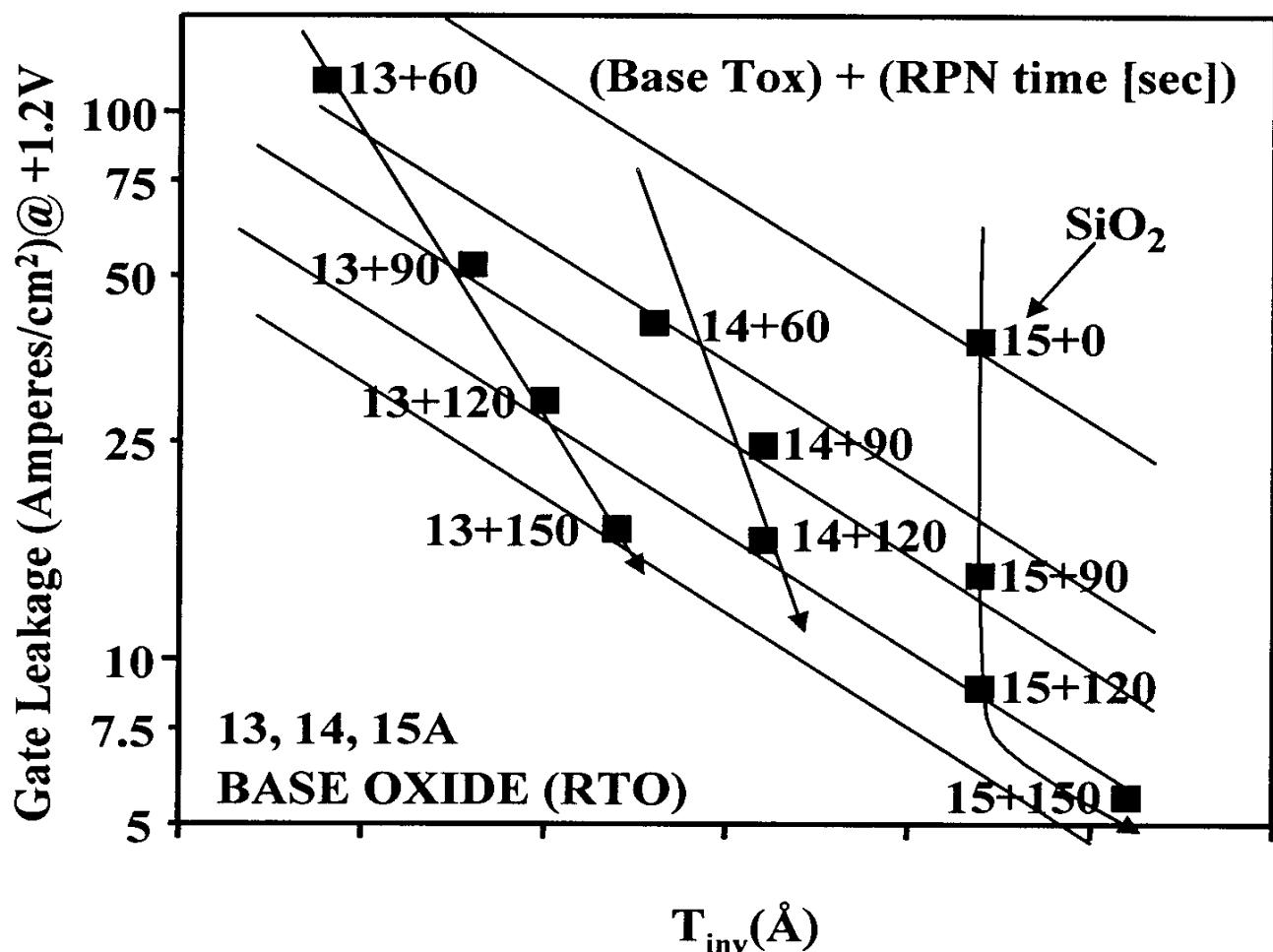


FIG. 1 PRIOR ART

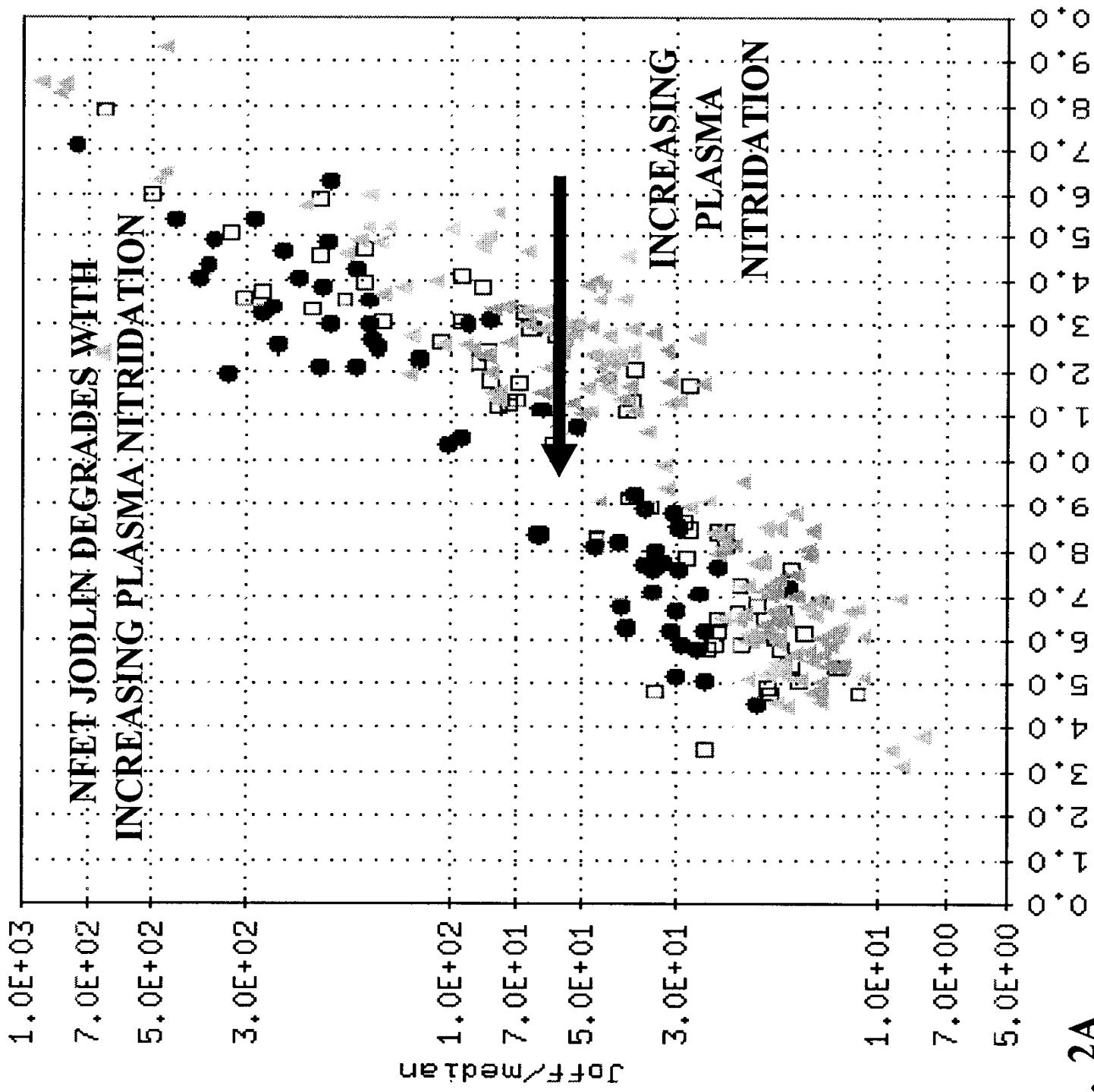
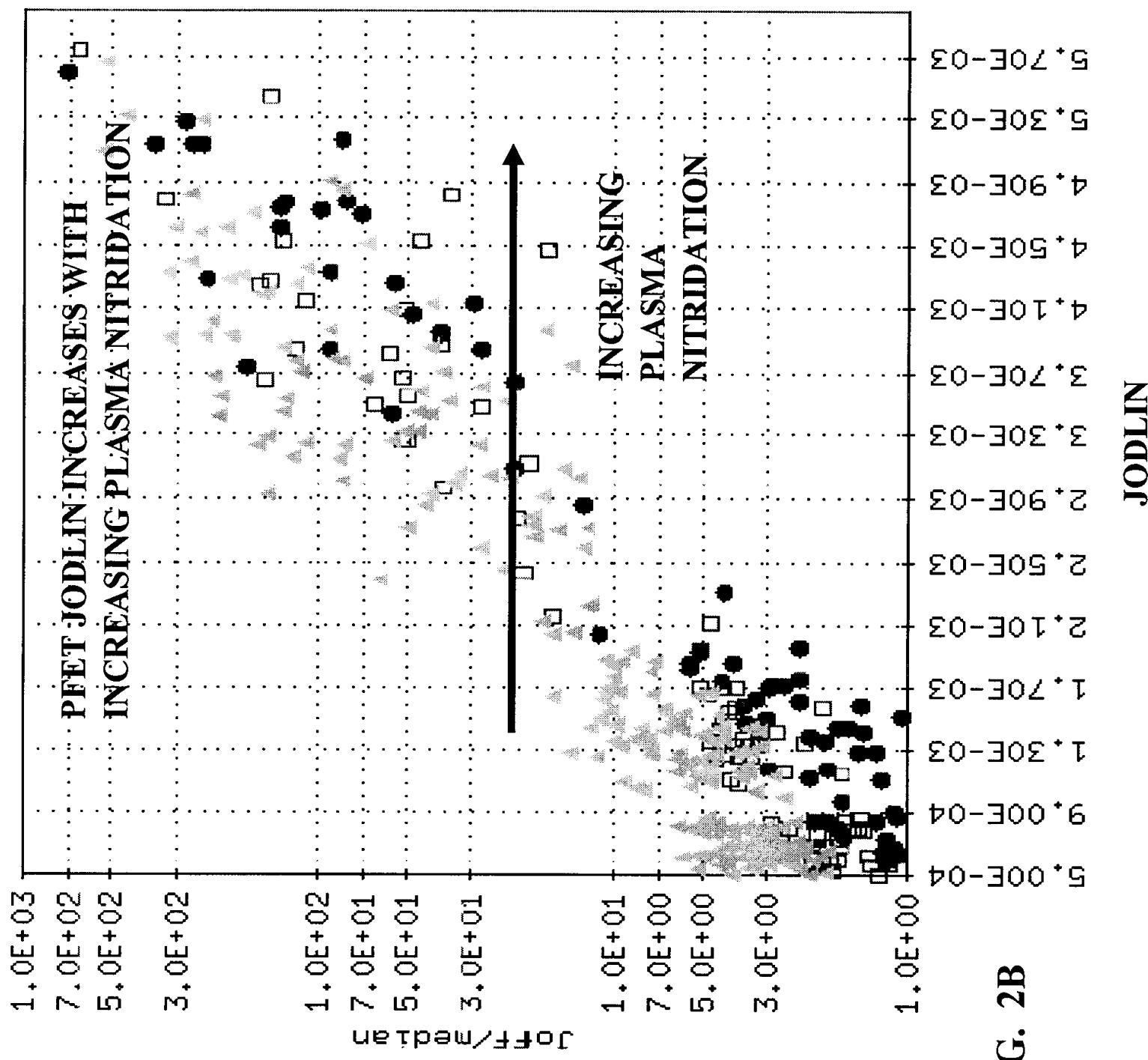


FIG. 2A

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NFET Mobility
Nitrogen Degrades NFET

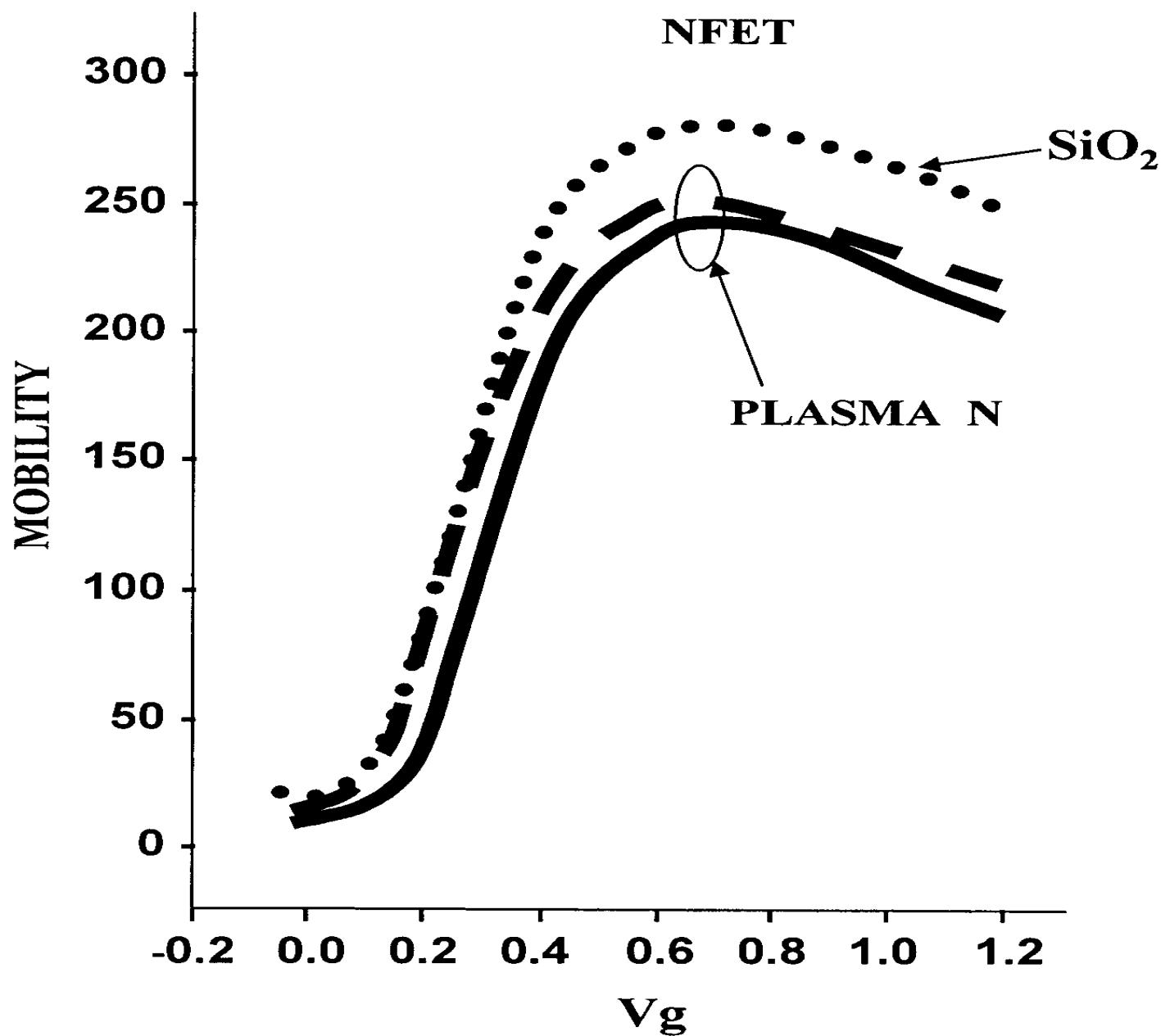


FIG. 3A

PFET Mobility
Nitrogen Improves PFET

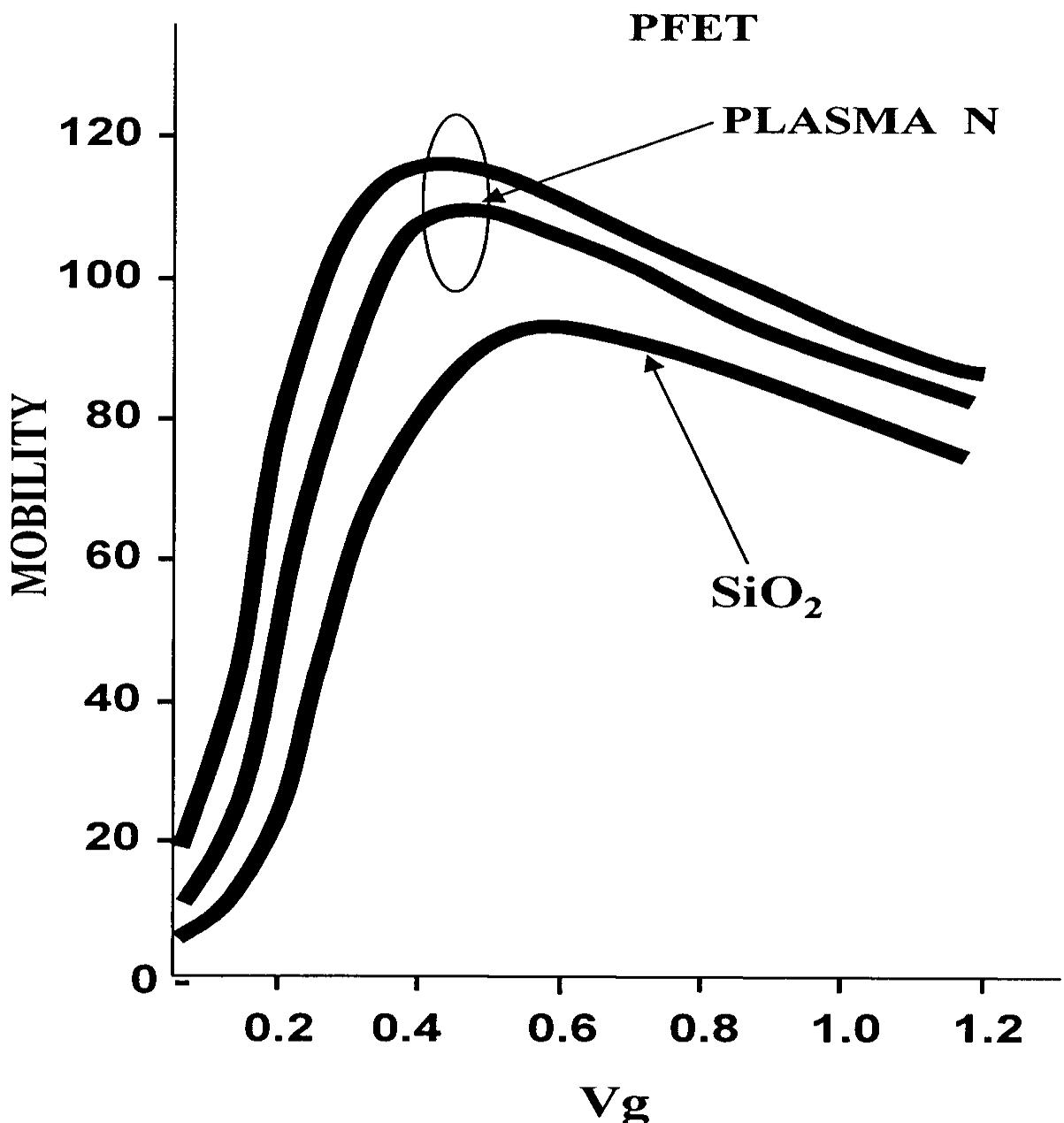


FIG. 3B

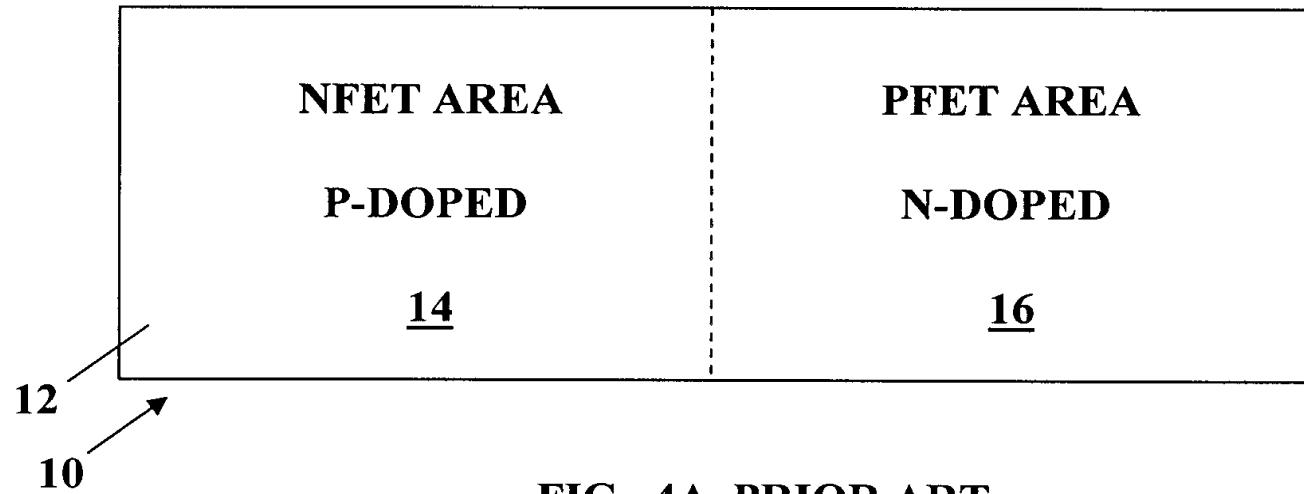


FIG. 4A PRIOR ART

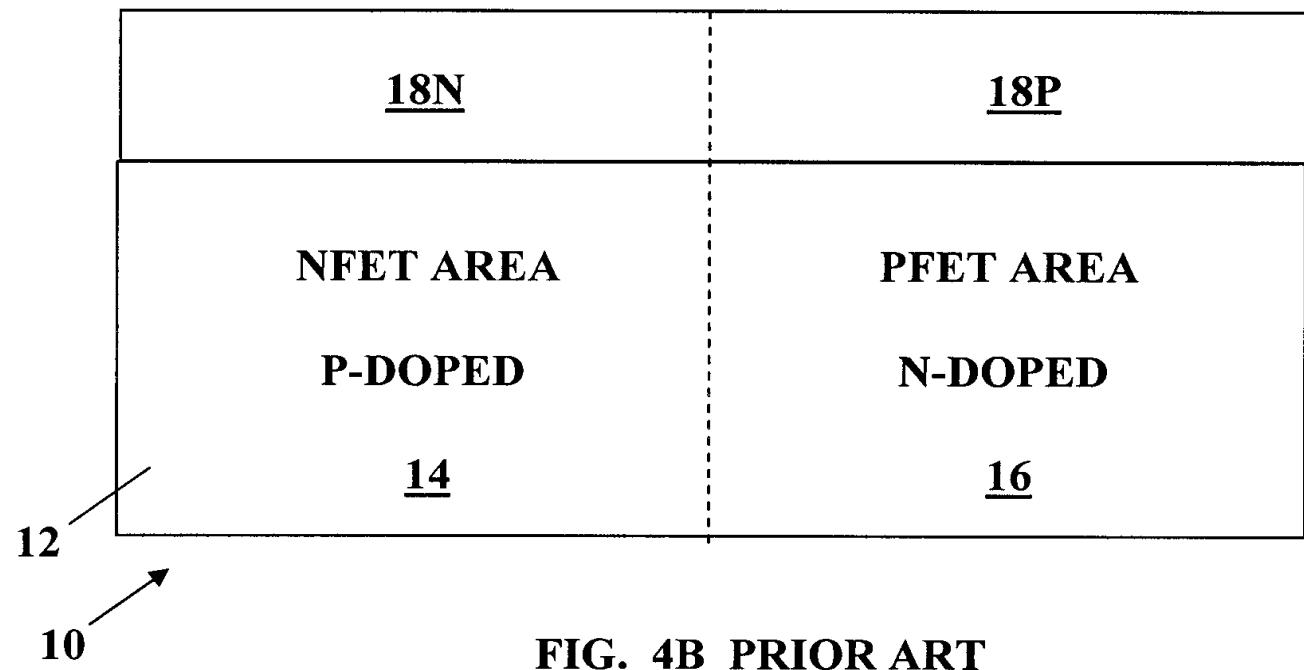
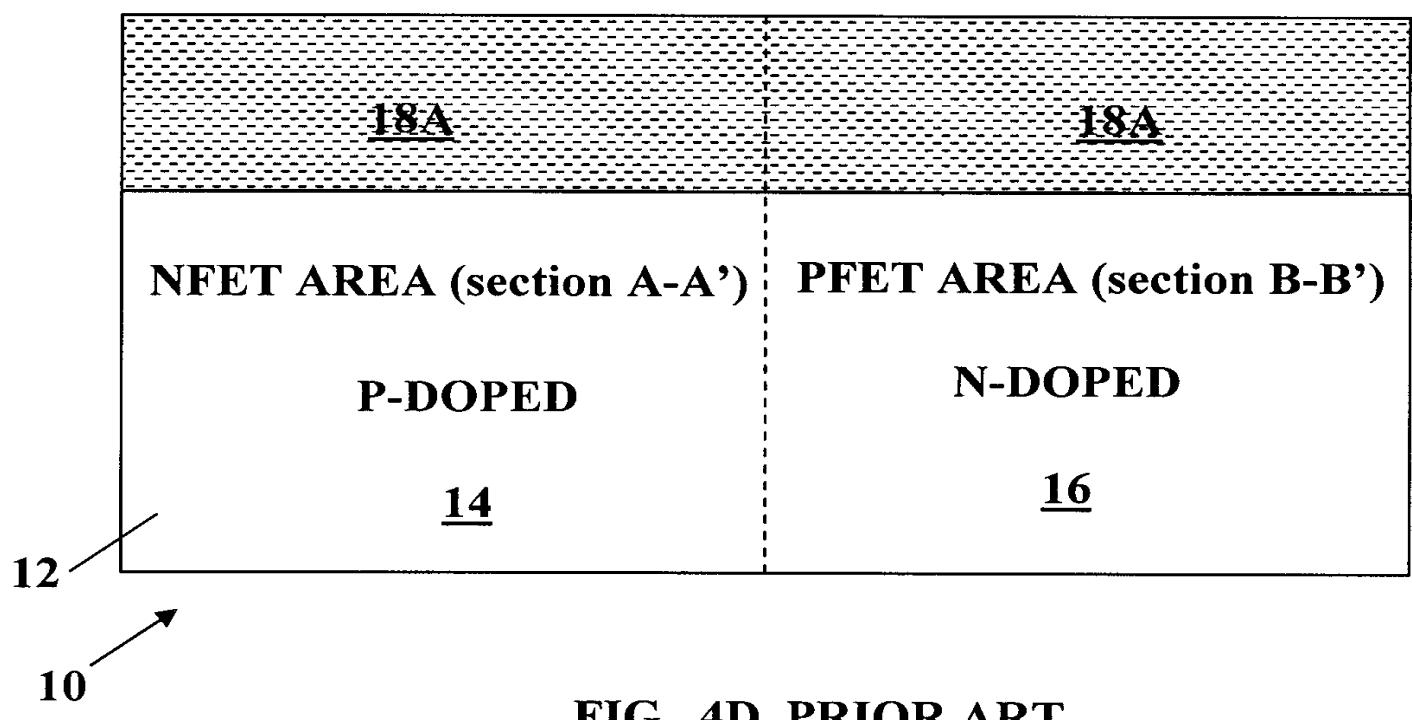
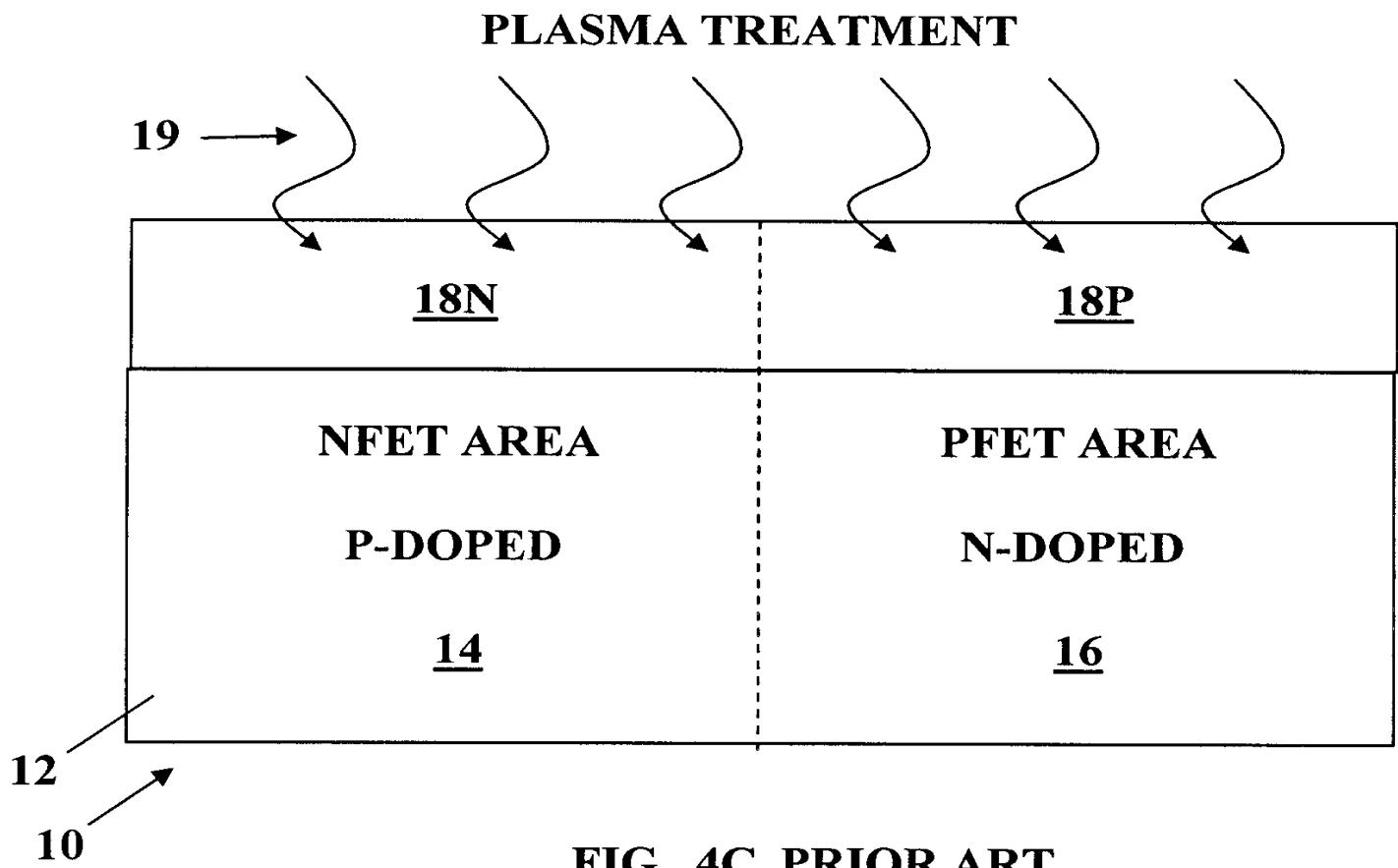


FIG. 4B PRIOR ART



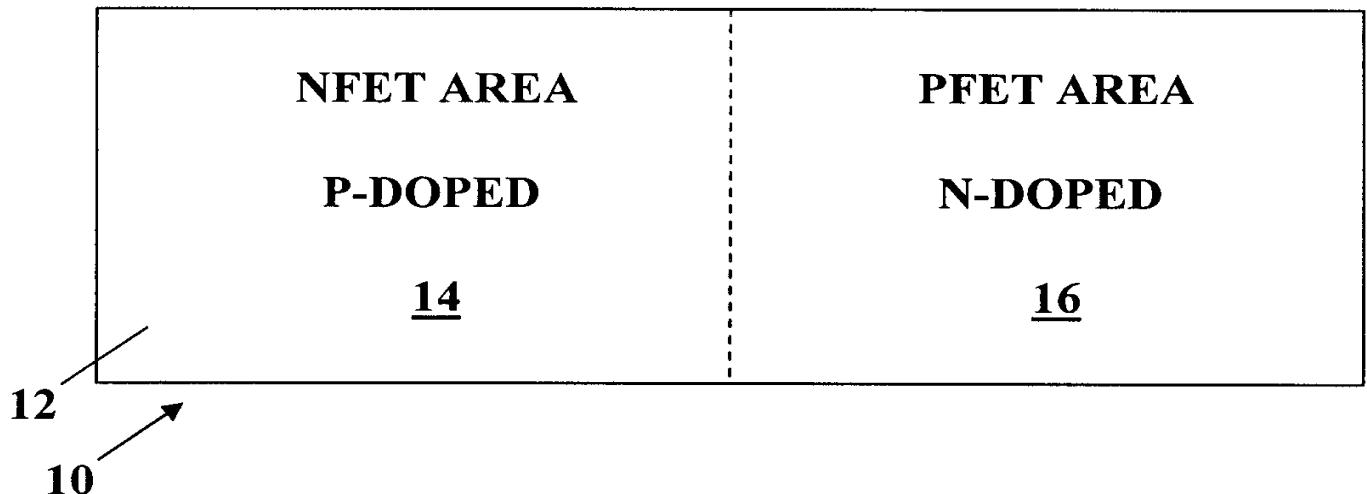


FIG. 5A

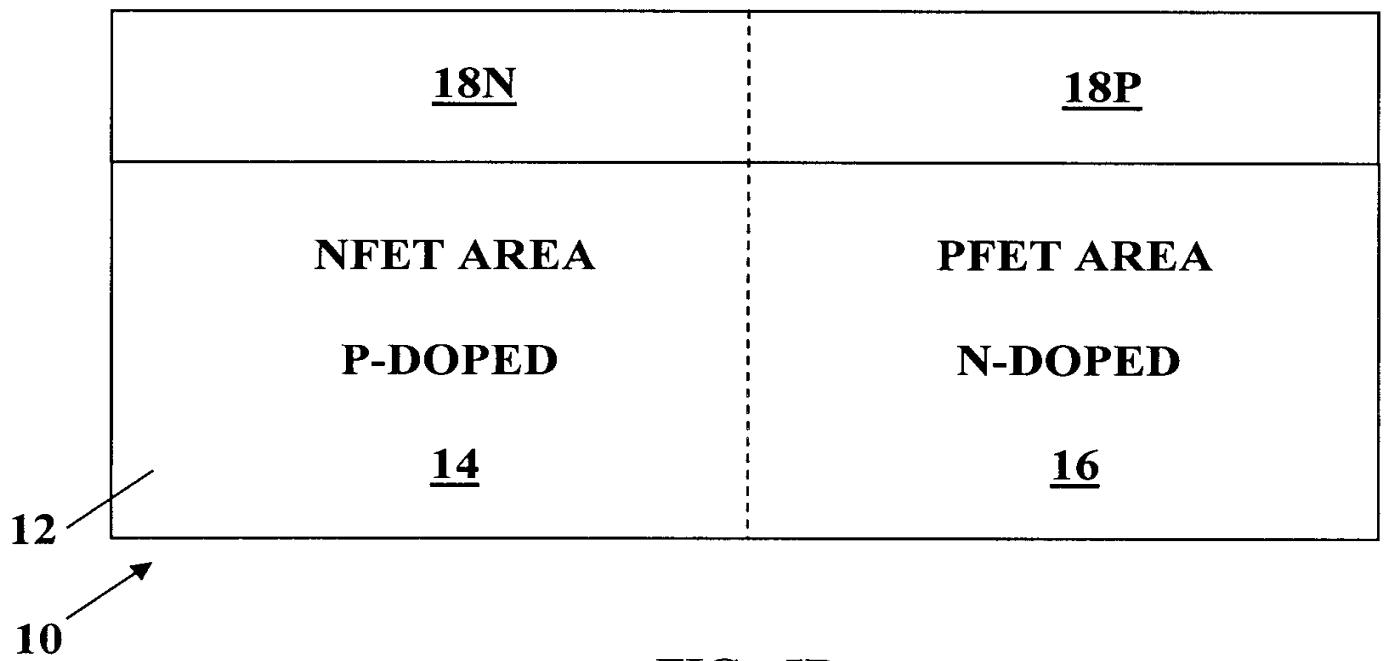
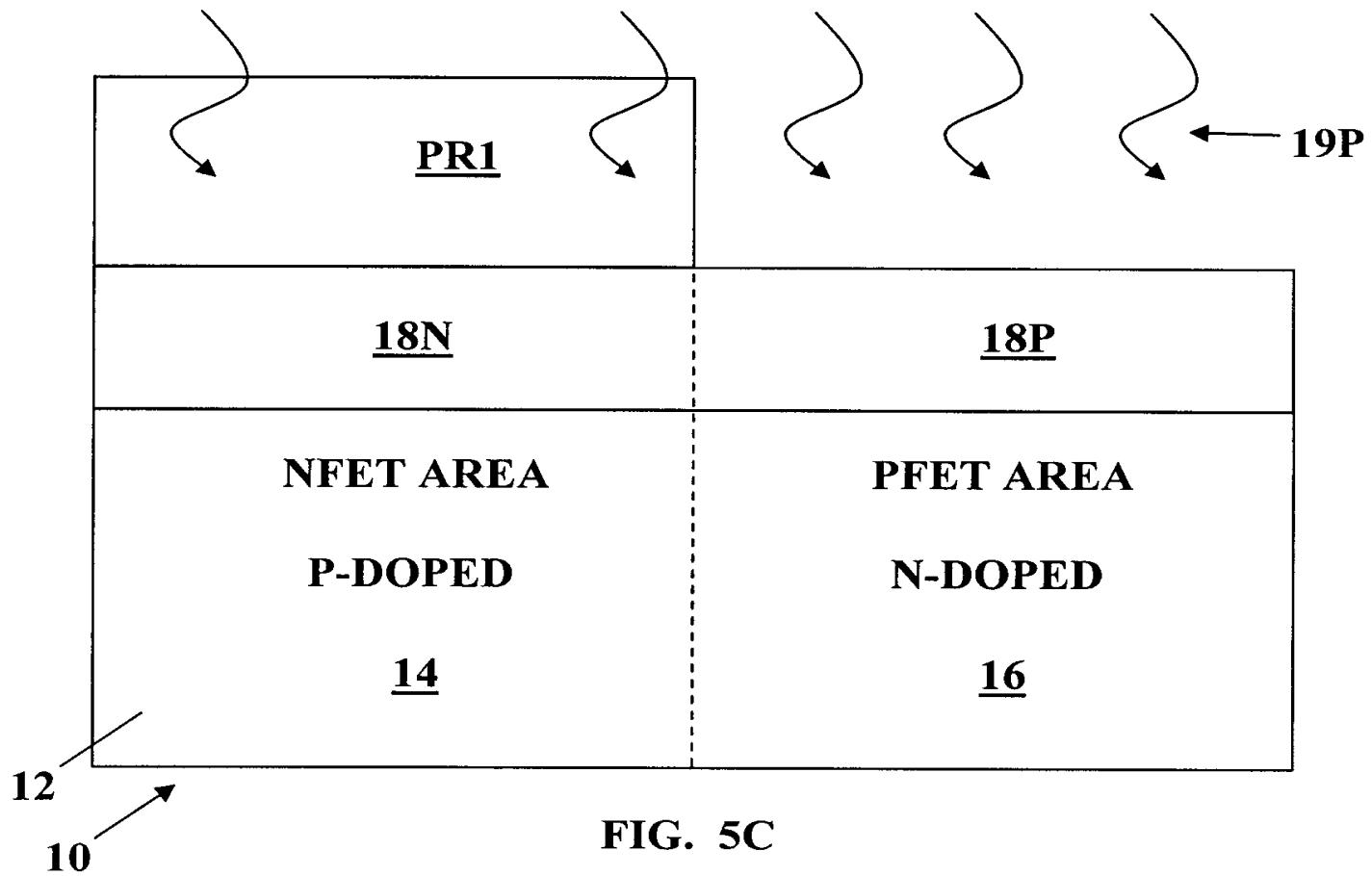
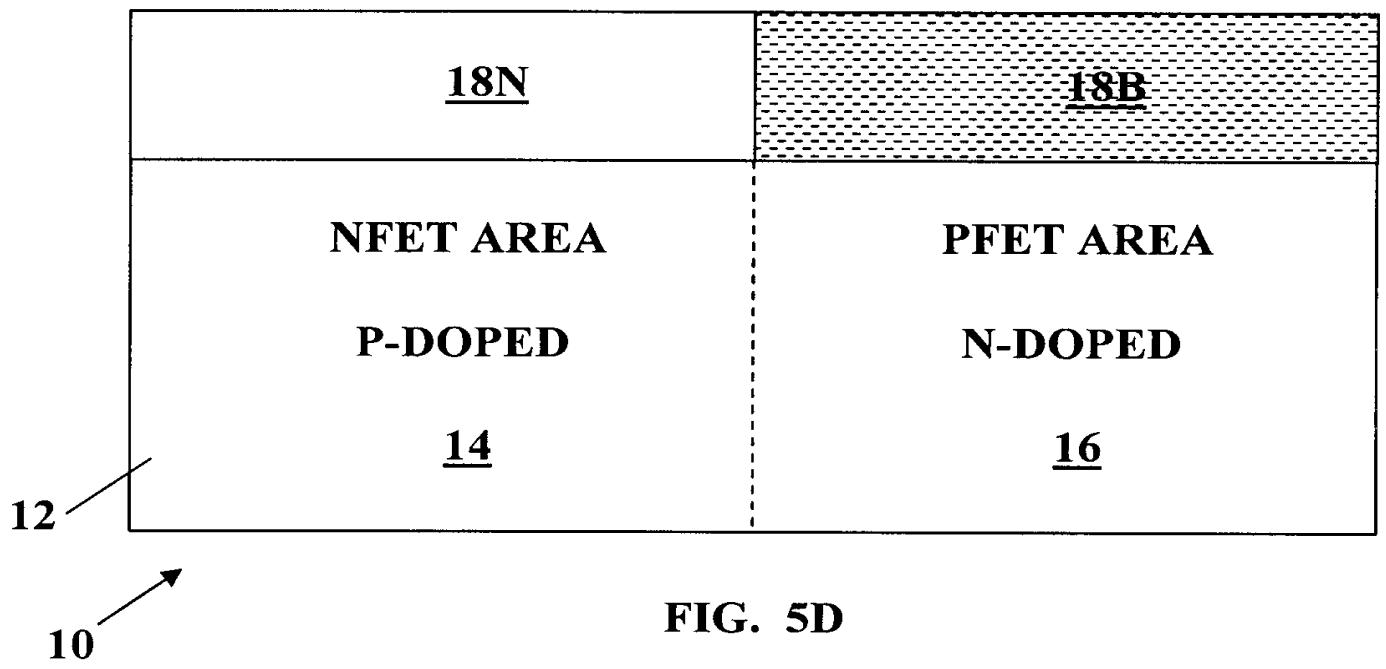
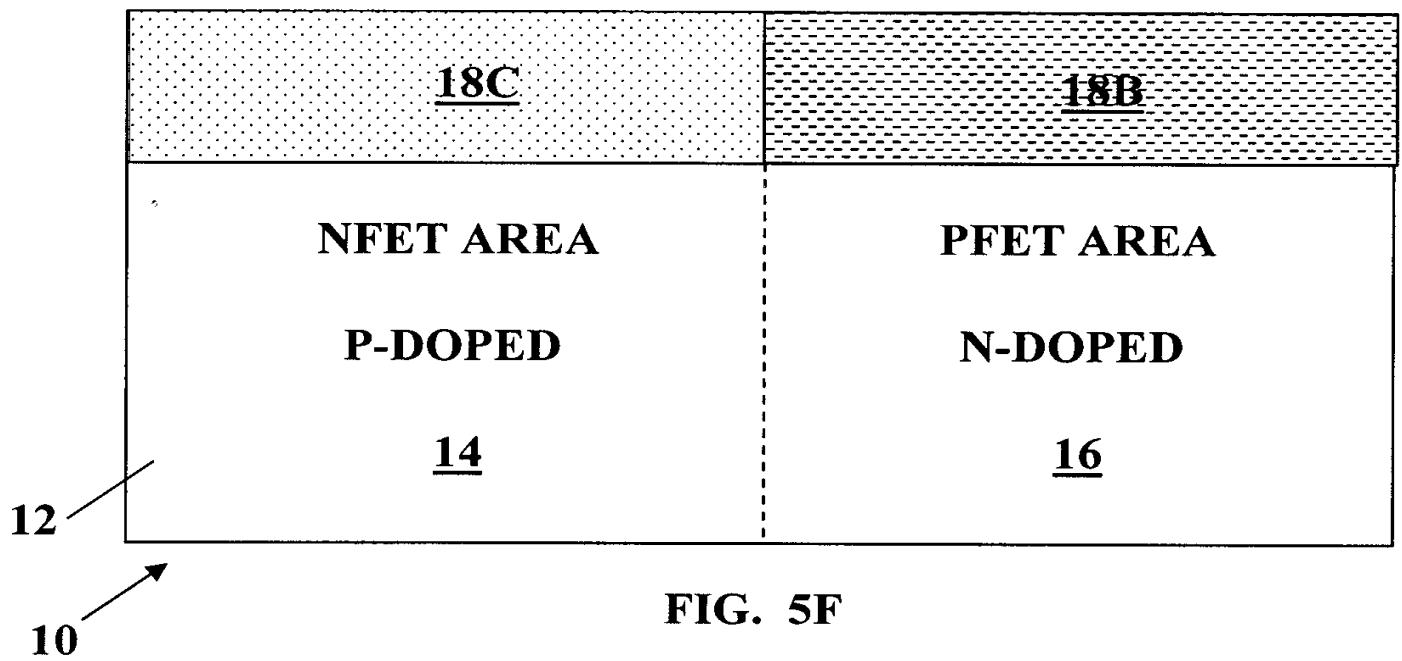
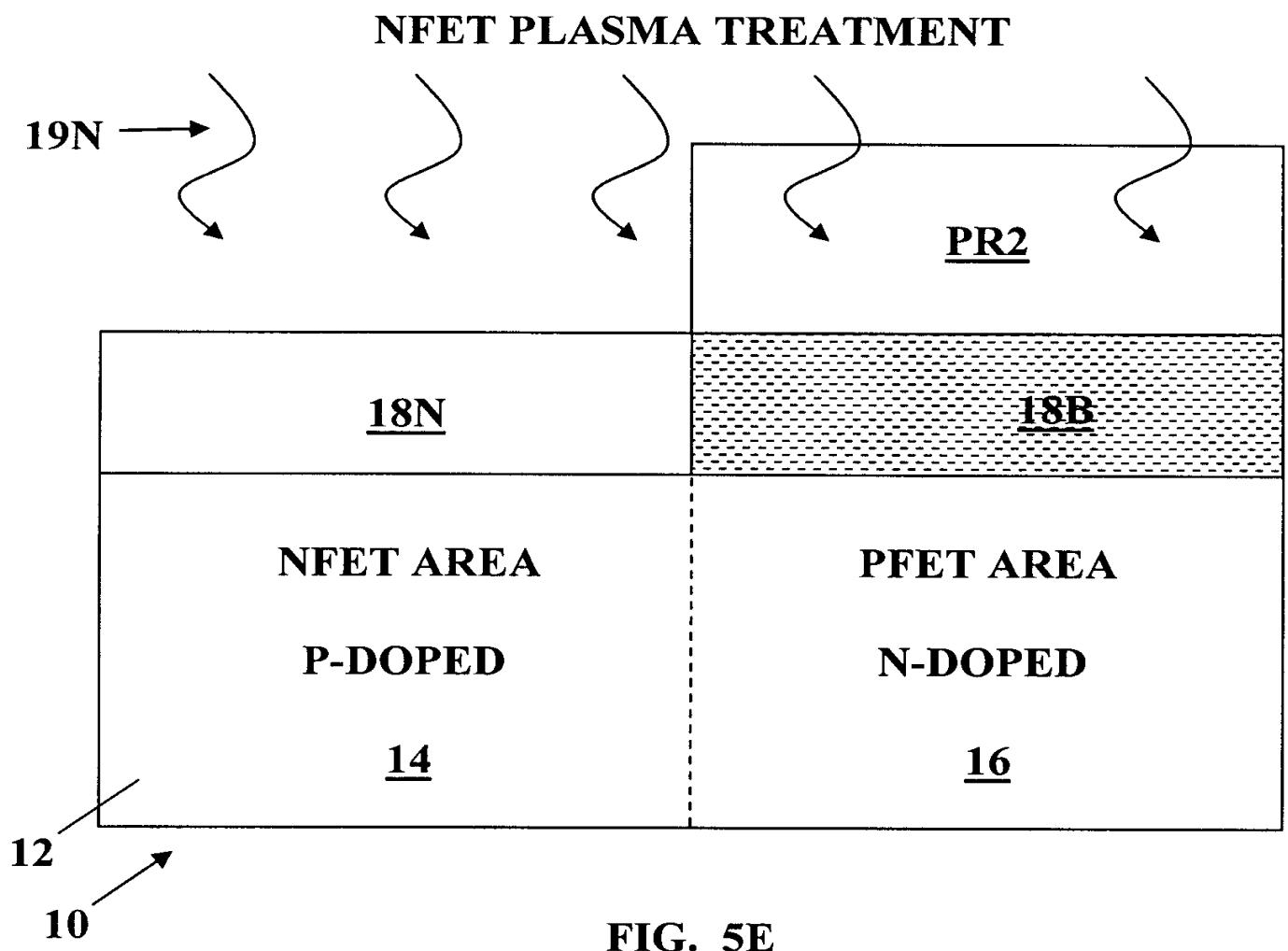
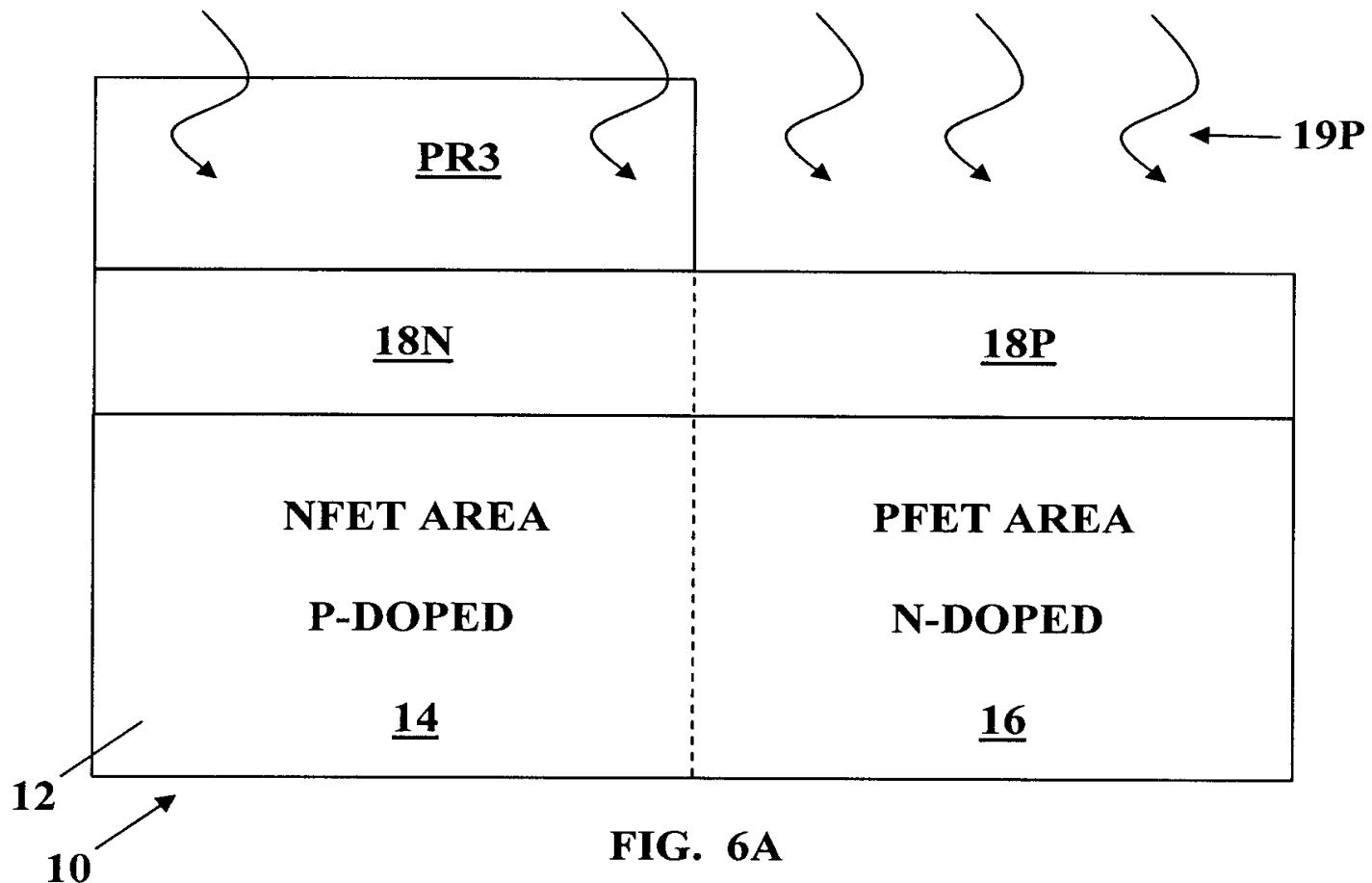
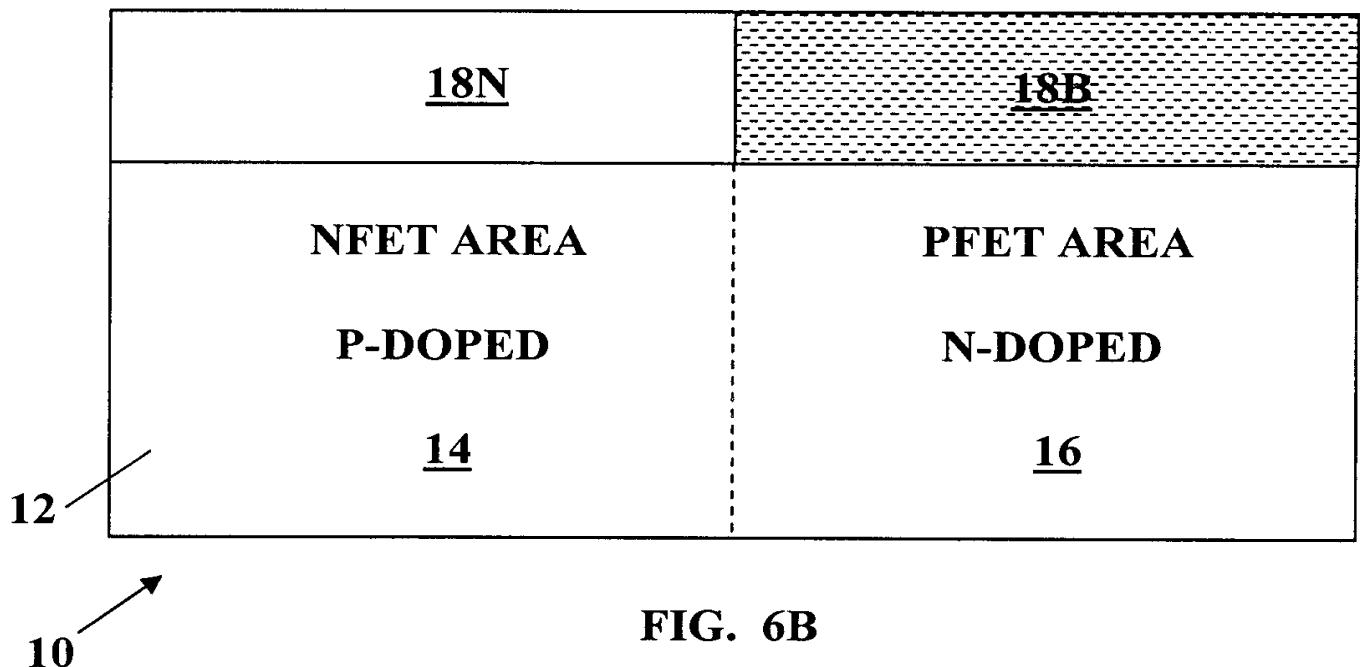
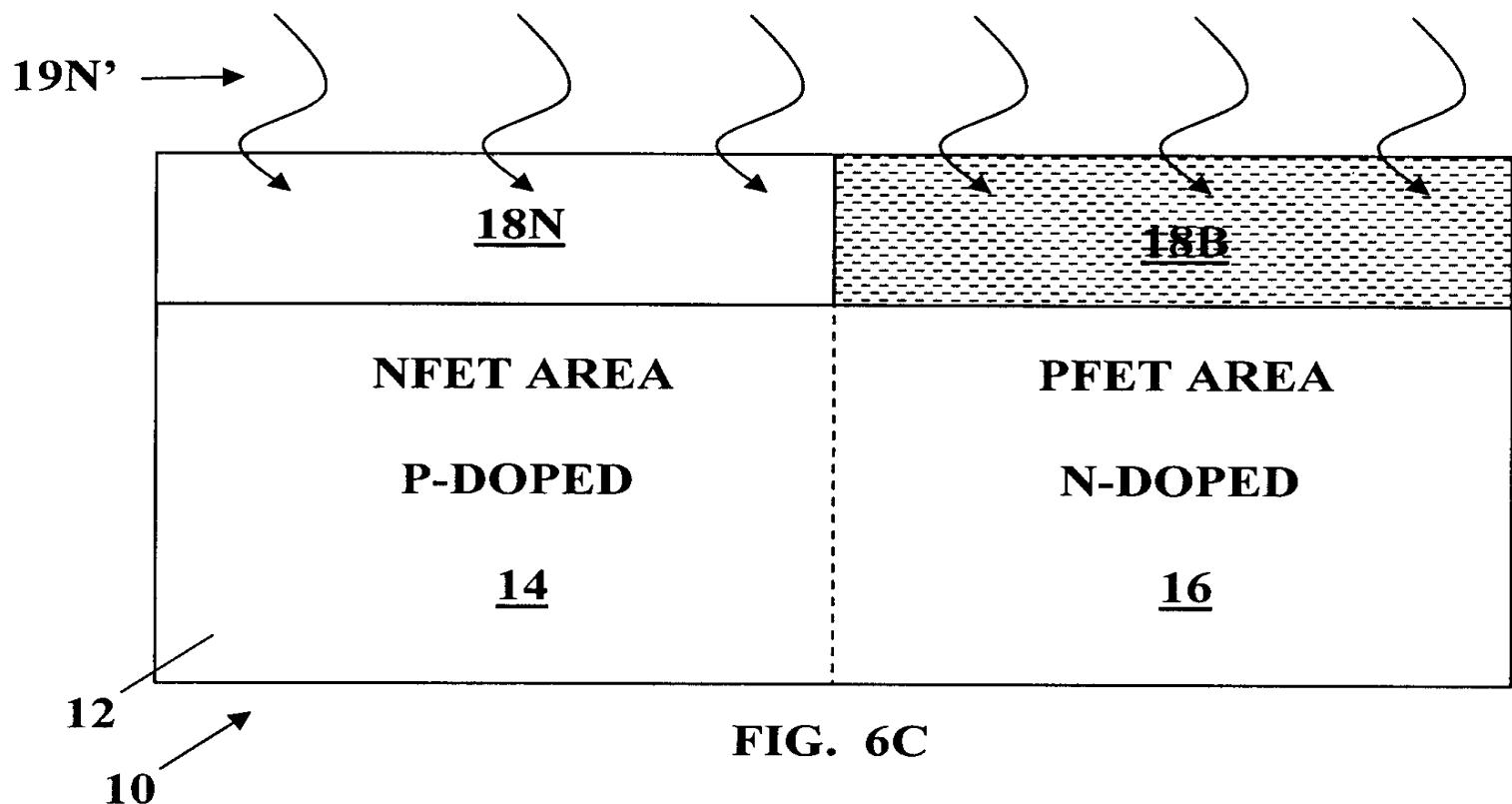
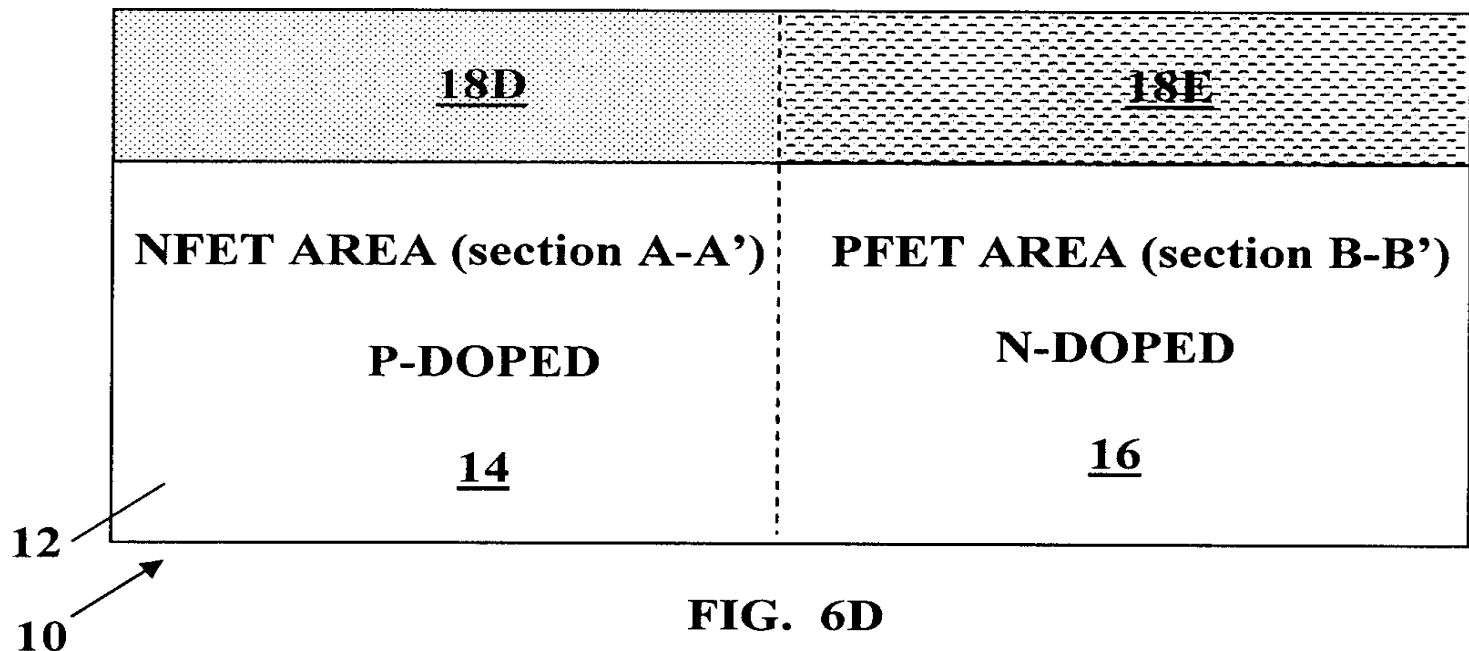


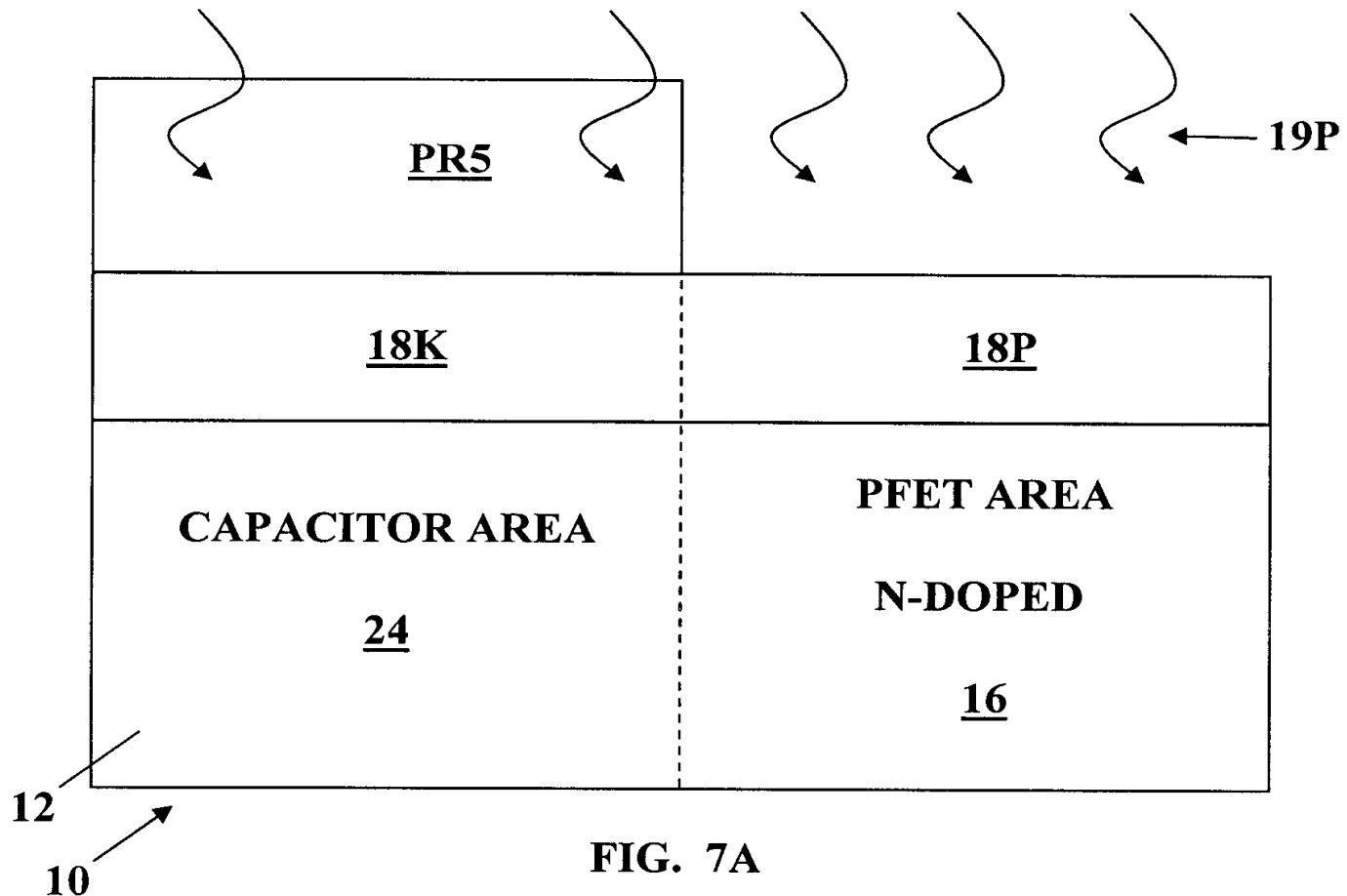
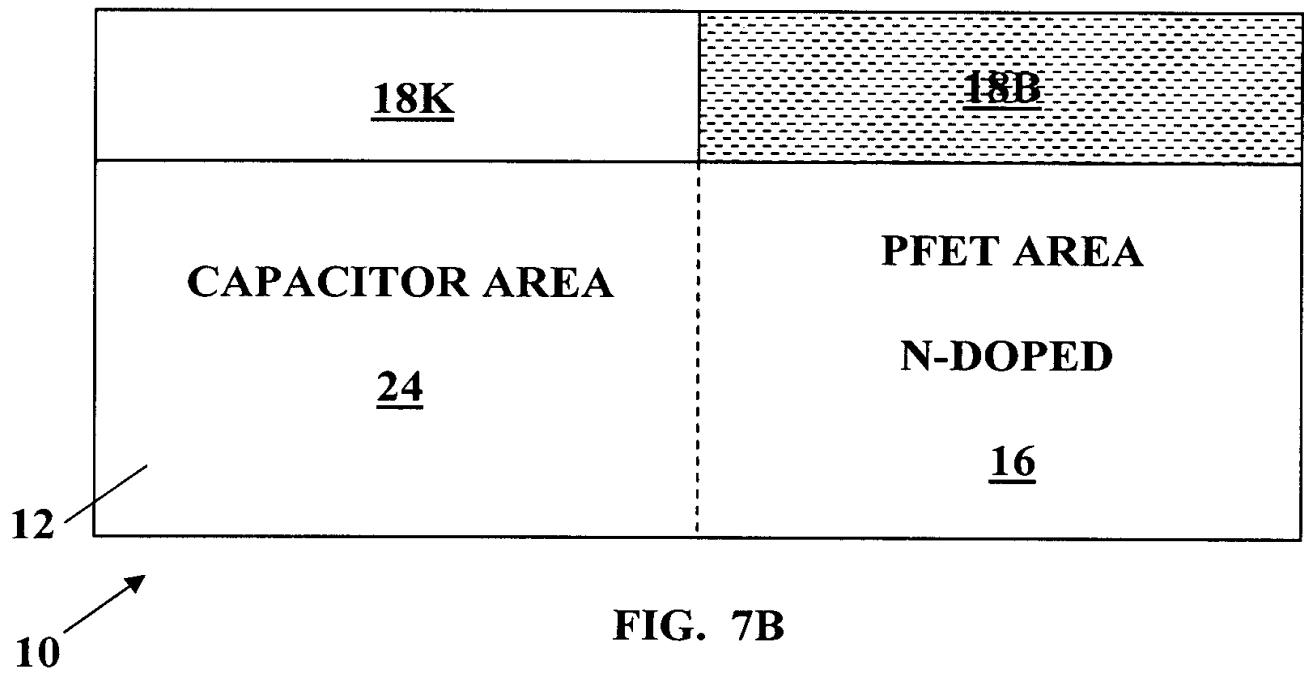
FIG. 5B

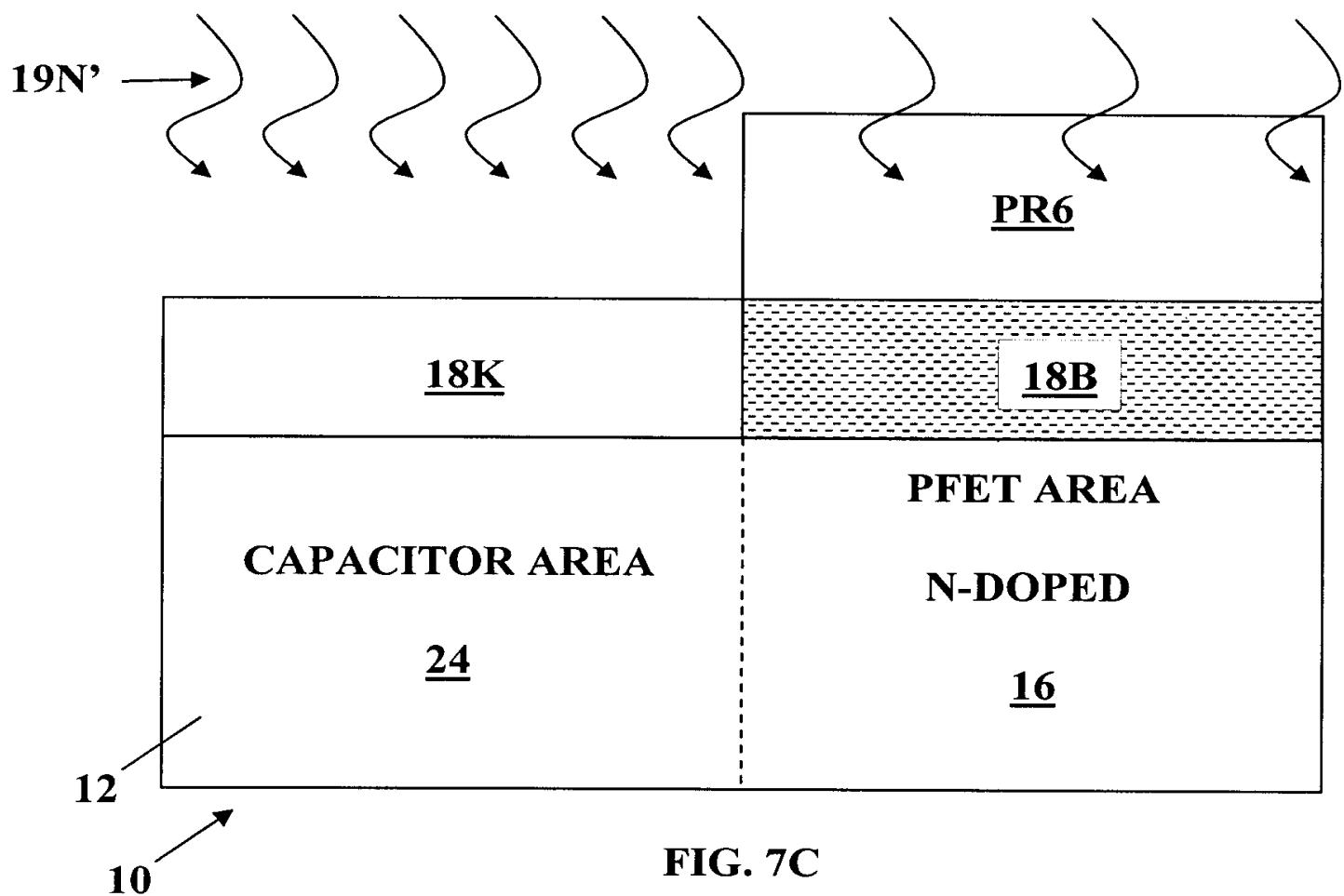
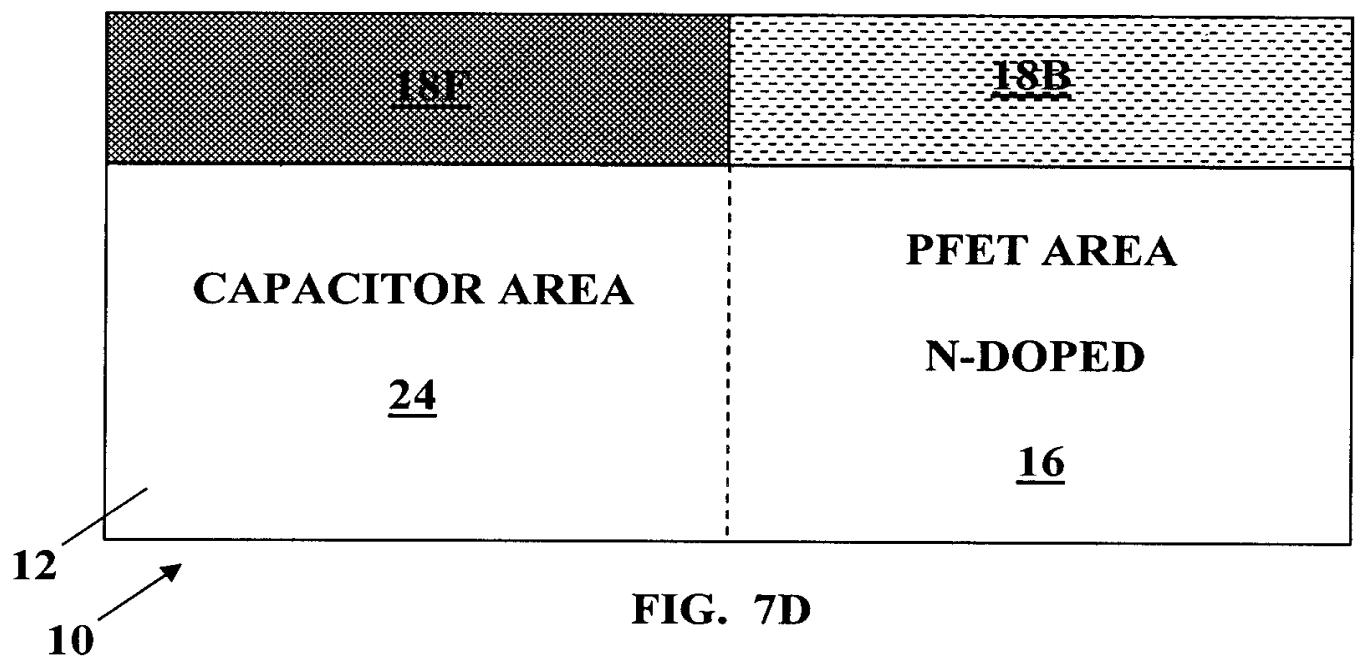
PFET PLASMA TREATMENT**FIG. 5C****FIG. 5D**

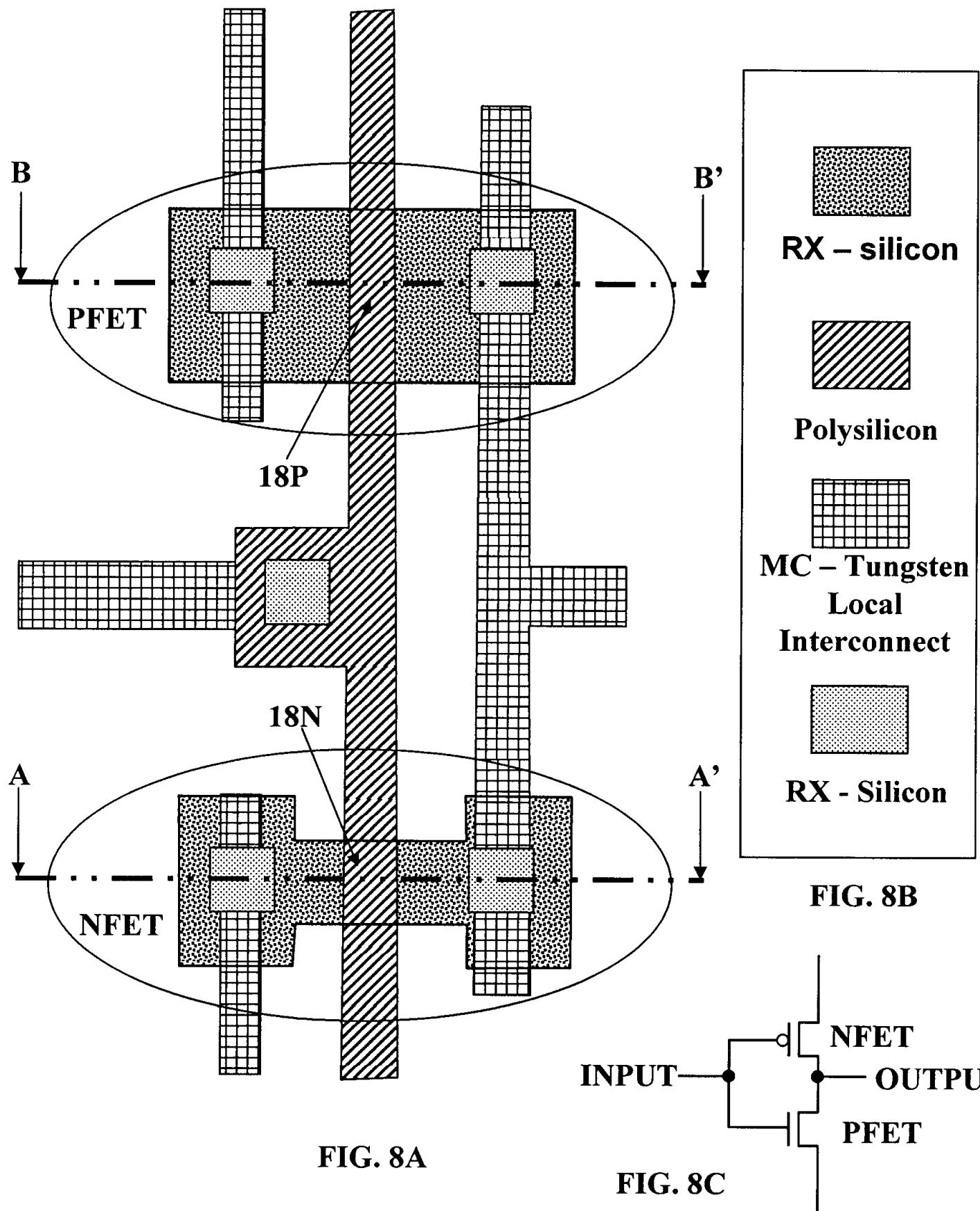


PFET PLASMA TREATMENT**FIG. 6A****FIG. 6B**

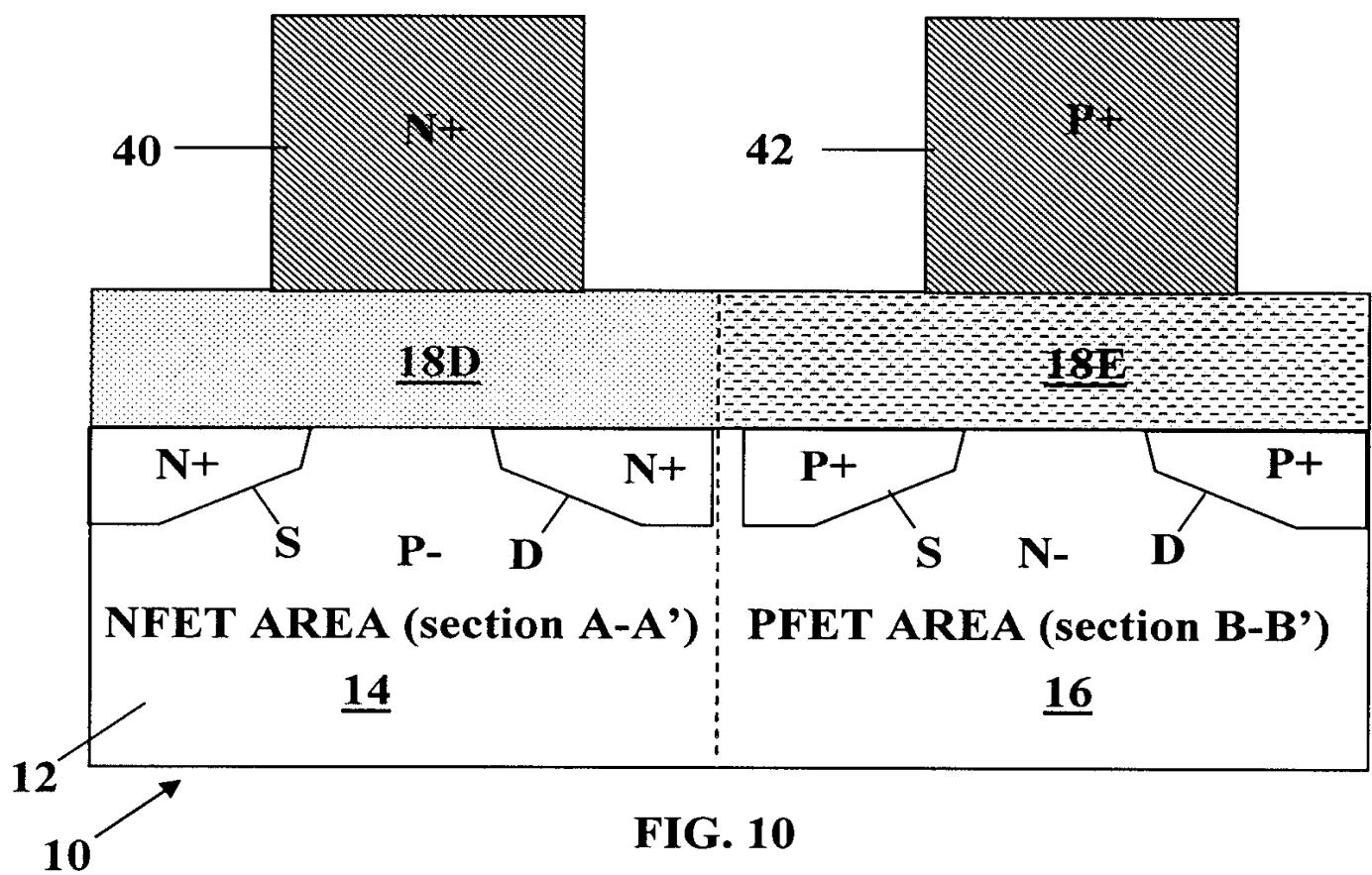
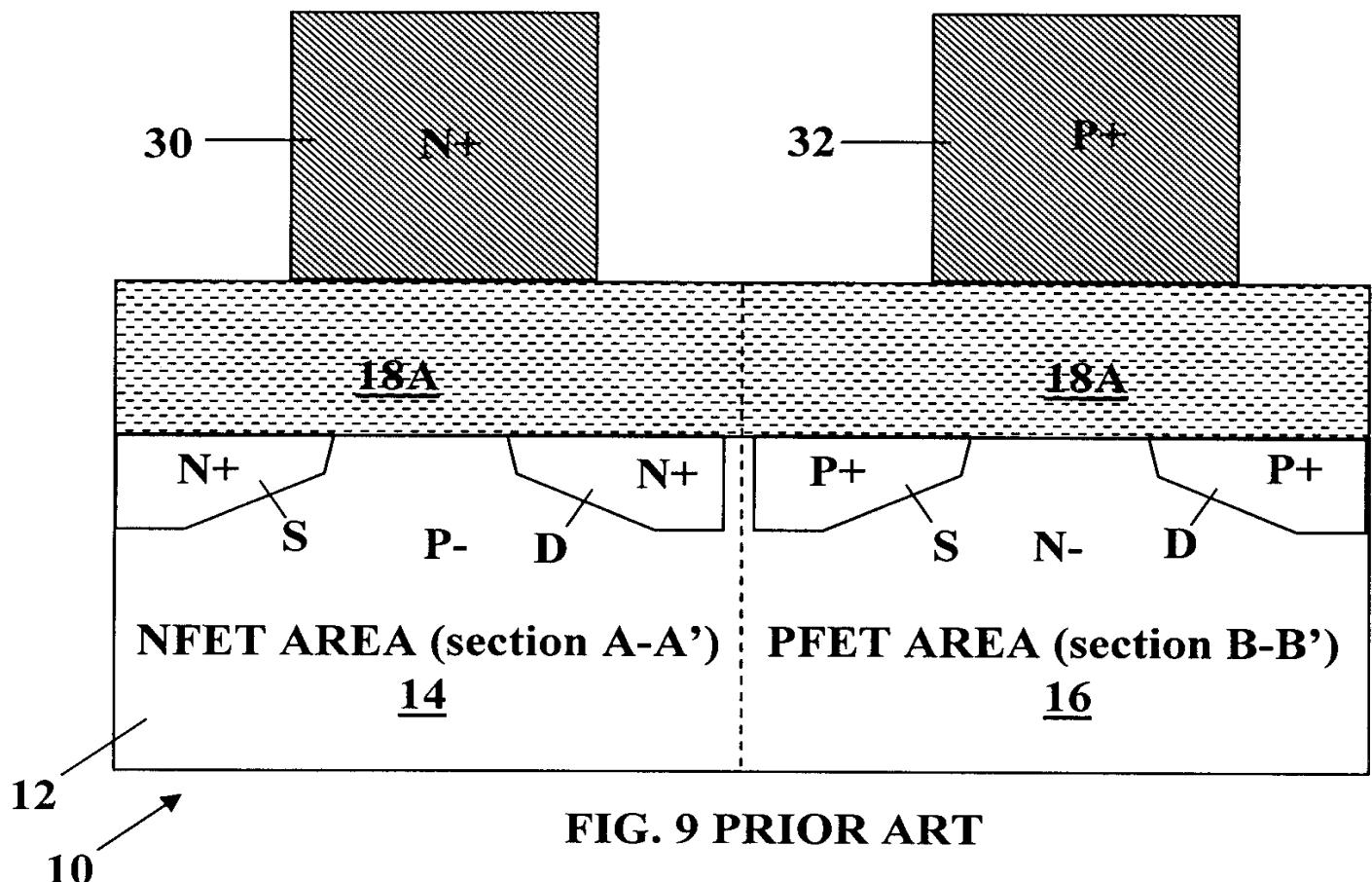
ADDITIONAL PLASMA TREATMENT**FIG. 6C****FIG. 6D**

PFET PLASMA TREATMENT**FIG. 7A****FIG. 7B**

CAPACITOR PLASMA TREATMENT**FIG. 7C****FIG. 7D**



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NITROGEN CONCENTRATION	GATE LEAKAGE			MOBILITY			PERFORMANCE	
	PFET oxynitride	NFET oxynitride	PFET gate leakage	NFET gate leakage	PFET mobility	NFET mobility	CMOS performance metric (NFET+PFET)	
A	0E15	0E15	-	-	0	0	0	0
B	1E15	0	0	0	0	0	0	0
C	2E15	+	+	+	-	-		
D	2E15	+	0	+	0	0		

Key: - = poor; 0 = acceptable; + = improved;

FIG. 11